Investigating Students' Use of Online Annotation Tool in an Online Reading Environment

NOR FARIZA MOHD NOR
School of Language Studies and Linguistics
FSSK, Universiti Kebangsaan Malaysia
MALAYSIA
fariza@ukm.my

HAZITA AZMAN
School of Language Studies and Linguistics
FSSK, Universiti Kebangsaan Malaysia
MALAYSIA

AFENDI HAMAT
School of Language Studies and Linguistics
FSSK, Universiti Kebangsaan Malaysia
MALAYSIA

ABSTRACT

Studies on the use of technology as a learning tool to improve student learning and educational outcomes have been considerably reported. It is believed that technologies can be used to effectively promote learning and support learner-centred approaches. The present study describes how students used an online annotation tool to help them interact more effectively with the assigned online reading materials. The study presents findings based on the students' usage of the Annotation tool; a type of technological tool which is designed to facilitate textual annotations and information sharing among the students when they read the assigned online materials The students are first year students who are enrolled for a compulsory subject in the English language Studies bachelor degree program. The students reported that they have difficulty understanding the new theories, concepts and terms taught in the course. Therefore, an online reading system, which integrates an online Annotation tool was designed to help students read the online materials. Data obtained from the survey questionnaire, which were distributed to 81 students and focus group interviews with 14 students revealed that the students managed to use the Annotation tool to process and comprehend the online reading texts in a more structured and systematic manner, compared to writing off line notes on the reading materials. They were also able to share their online notes and discuss the online reading materials with their friends and lecturers The results suggests that the employment of Annotation tool in a guided and structured way assist the students in their interactions with online reading materials.

Keywords: online reading; e-learning; electronic materials; annotation; ESL

INTRODUCTION

It is of no doubt that educational approaches have changed in response to the widespread use of technology, whereby the integration and implementation of information technology to support learning provide various educational opportunities for students throughout the world. Therefore, knowledge building has been refashioned from the fundamental way of learning into an effort to initiate students into a knowledge creating culture (Scardamalia & Bereiter 2006). Students are not only involved in developing knowledge-building competencies but are also seeing themselves and their work as part of the civilization-wide effort to advance knowledge frontiers (Scardamalia & Bereiter 2006, p.3). In addition, knowledge building is

conceived as a discourse with the aim of improving ideas, in which students are engaged in "the deliberate creation and improvement of knowledge that has value for the community" (Scardamalia & Bereiter 2003, in Scardamalia & Bereiter 2006, p. 100). In essence, students improve their understanding of the subject matter and gain knowledge by sharing information, exchanging ideas and opinions, and making suggestions and claims.

Studies have also established that technology can help motivate students to learn, in that learning has now moved beyond the classroom walls (Warschauer 1996). Therefore, the thoughtful integration of digital technologies into the traditional scheme of education to develop new ways of learning is necessary to ensure that students have the tools to thrive in a complex and rapidly changing technological society. In view of this, the present study investigated how the integration of several technological tools into an online reading system can help develop a more structured reading process. The present study, hence, reports on one particular tool in the online reading system, which is the Annotation tool.

Historically, Annotations have served as personal records of reading and interpretations of what has been read. Constantopoulos et al. (2004, cited in Kopak & Chia 2007) point out that annotation serves as shared records of work and opinion within specific communities. Healy (1999, cited in Kopak & Chia 2007) argues that annotation engages readers in thinking, making mental connections, and meaningfully linking ideas. Studies on the annotation habits of students and professionals demonstrated that the readers' annotations are highly goal–oriented (Wolfe 2000, Marshall et al. 1999, Marshall & Brush 2004). In an online environment, online annotation programs facilitate annotation-sharing practices in various ways; comments are stored in a file or database where they could be distributed to other users, or they might be stored in the same stand-alone file as the primary text. Users can create coding schemas for their annotations by selecting from multiple colours, fonts and presentation styles or create hyperlinks that take readers to other documents which can be inserted into online annotations and many more. Golovchnisky and Marshall (2000) maintain that annotations can help readers navigate documents, functioning much as user-created hyperlinks that allow readers to look up for information, pursue citations, or return to earlier sections of documents, hence, emphasizing the intertextual nature of reading.

The design of the online annotation tool in the present study takes into account personalized reading and collaborative learning factors. This allows the reader to 'mark-up' a reading text. The 'mark-up' function includes highlighting (three colours are provided for highlighting), underlining and writing notes. A survey which was conducted prior to designing the online reading system revealed that students employed several reading strategies during reading process; underlined important points, highlighted words that they do not understand, asked questions to themselves about the texts and inserted prompts within the texts (Afendi Hamat, Nor Fariza Mohd Nor, Hazita Azman, Nadzrah Abu Bakar & Noorizah Mohd Noor 2010). This means that markings made on the texts while reading help the students to understand, remember and process information in a more structured way because annotation occur within the context of the document. Students 'mark-up' the online texts not only for personalized reading, but for sharing notes with their friends. The process of sharing information, thus, encourages collaborative learning.

Any form of highlighting, underlining, inserting prompts such as asking questions, expressing agreement, disagreement, justifying claim and making short notes are categorized as annotation in the present study. In addition, Marshall's (1997) classification of annotation, which he categorizes by forms and functions, is also referred to in identifying the types and function of annotations made by the participants in this study. The annotation types proposed by Marshall (1997) are underlining or highlighting titles and sections (signal for future

attention), highlighting and marking words or phrases and within text-markings (signal for future attention and to memorize the annotated section), notation in margins or near figures (comprehension purpose), and notes in the margins or between lines of text (to interpret the whole text and reduce the cognitive load of the reader). The Annotation tool in this online reading system allows the students to create textual annotation, multimedia annotation and sharing of information. Figures 1 and 2 are screen shots of some of the annotations made by the students.

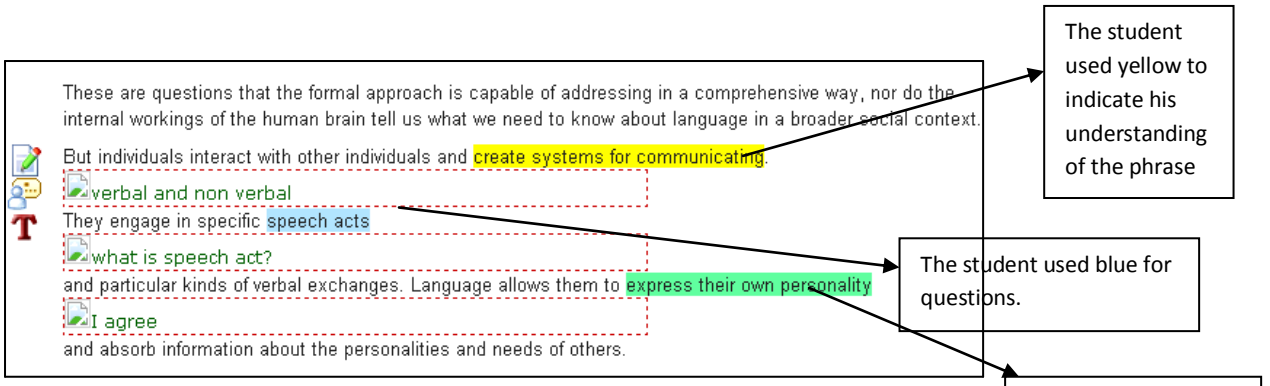

FIGURE 1

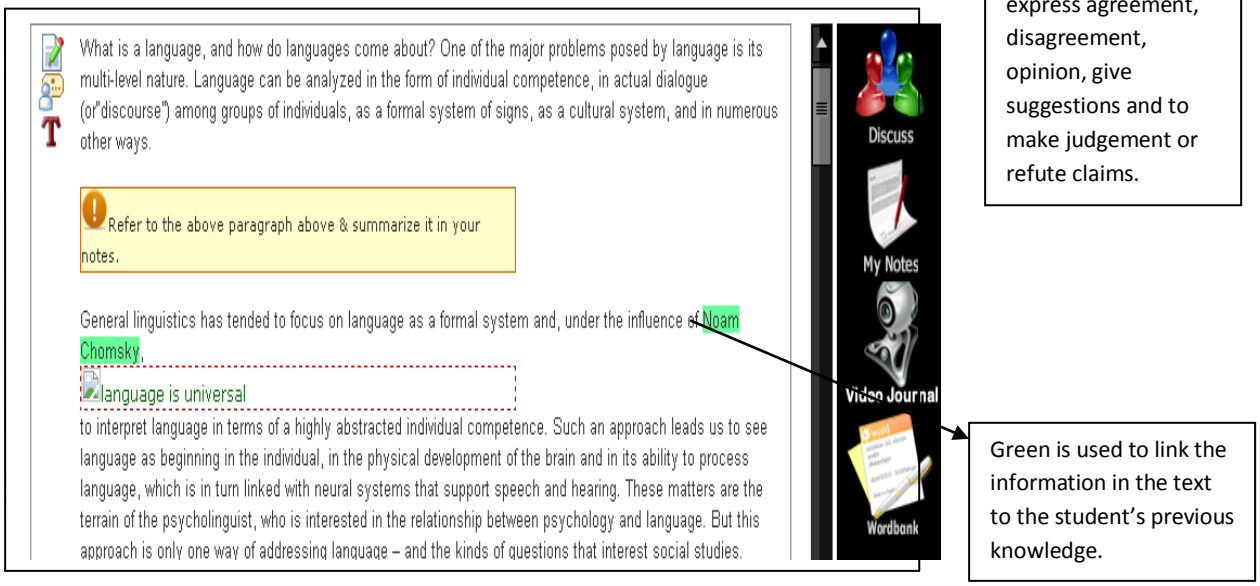

FIGURE 2

ONLINE READING BEHAVIOUR

Reading is recognised as an essential skill for all students particularly at the tertiary level. Reading involves interactive participation between the reader and the text in building meaning because the reader is involved in the process of synthesizing, evaluating, and interpreting the reading material. Healey (1990) and Birkets (1994) claim that digital media threatens sustained reading. Birkets (1994) further contends that generation Y who are exposed and are very much involved in the digital environment lacks the ability to read and to maintain an extended or prolonged engagement in reading. Bolter (1991) argues that the shift from computer to electronic texts means a shift in literacy, for technology offers a new kind

of book and new ways to write and read. The shift is evident in how reading has become non-linear and more interactive with the convergence of text and images, audio and video (Landow 1992, Lanham 1993, Murray 1997, Ross 2003). The International Reading Association (2001), in response to the new literacy era suggests that "traditional definitions of reading, writing and viewing, and traditional definitions of best practice instruction – derived from a long tradition of book and print media - will be insufficient" This view supports Coiro's (2003) argument that electronic texts have introduced "new supports as well as new challenges that can have a great impact on an individual's ability to comprehend what he or she reads". Selfe (cited in Pianfetti 2001, p.256) further asserts that the integration of technology into the curriculum has expanded the definition of literacy from "traditional notions of reading and writing to include the ability to learn, comprehend and interact with technology in a meaningful way". Besides processing digital texts, readers need to engage in constant decision making regarding the forms of multimedia available to them, such as pictures, audio and video (McKnight 2003, Shoerey & Mokhtari 2001).

Reading is not a single activity for it involves different purposes and requires different skills in handling documents. McKnight (1997) observes that people do not like to read from screens. They prefer to print out documents for reading, especially documents that are long and cannot be displayed on a few screens. This implies that manipulating electronic documents require a different set of skills. Studies which investigated online reading behaviour reported preference for reading printed documents. A study on students' reading practices at the National University of Mexico by Ramirez (2003) revealead that nearly 80 percent of students preferred to read a digital piece of text in print, in order to understand the text better. Nearly 68 percent of the respondents reported that they understand and retain more information when they read printed media. Only 4 percent of the respondents reported the opposite. Murphy et al. (2003) found that undergraduate students who read online text reported that the text is more difficult to understand and less interesting than those who read the printed version. Similarly, Hartzell (2002) also notes that reading from a monitor is up to 30 percent slower than reading the same text on a printed page. Ross (2003), therefore, suggests that we need to pay more attention to readers' engagement in different media, their reason for choosing one format over another and their satisfactions with each format.

Educational approaches have changed considerably in response to the widespread use of technology, resulting in a shift away from reading paper documents to reading digital copies of documents. In fact, educators are using these online materials to a large extent as supplementary reading materials in their teaching. In addition, there is increasing number of learners in many parts of the world who are exposed to authentic language on the topics they are learning about, through the internet and available software. Consequently, online reading serves as the source of input for thousands of L2 readers, and concomitantly changes the nature of literacy. Sutherland-Smith (2002) states that students "perceive Web text reading as different from print text reading" (p. 664). With the availability of digital information and the increasing amount of time spent reading electronic media, it is relevant to explore and understand this shift in reading behavior, from printed materials to digital media. Therefore, in the light of new forms of literacy, educators must begin to focus on how technology is changing the reading process.

Previous studies which attempted to explore reading in the digital environment examined how reading behaviour has evolved or observed how people read documents (especially electronic documents) within a specific period of time. The present study attempts to explore how a group of ESL students used a specific technological tool, which is referred

to as online Annotation tool to help them read and comprehend electronic texts. The study addresses the following questions:

1. What do the students use the annotation tool for?
2. How does the annotation tool help develop understanding of the reading material?
3. What is the result of using annotation tool on the reading process?

READING AND ANNOTATION

A survey on online reading behaviour reports that readers do the following: viewing and scanning, keyword spotting, one–time reading, non–linear reading and reading more selectively (Liu 2005, Rowlands, Nicholas, Jamali, & Huntington 2007, Nicholas, Huntington, Jamali, Rowlands & Fieldhouse 2008a, 2008b). The structure of text has also changed with online materials. Nicholas, et al. (2008a) state that paragraphs and sentences are now the unit of consumption –something which will appeal to the readers in digital environment, especially students, who prefer bite size chunks of information. Chi, Gumbretch and Hong (2007) and Chi et al. (2005) argue that different reading behaviour depends on how the reading materials are annotated. For example, Chi, Gumbrecht, and Hong (2007) found that the eye trace depicts a sequential reading behavior when reading a clean copy, i.e. in general reading, people tend to read linearly. On the other hand, when reading highlighted text, empirical studies showed that people tend to be attracted to read the highlighted area. In fact, an important characteristic of processing information actively is making annotations while reading (Adler & Doren, 1972, cited in Chiang, 2011). In other words, the most common activity is not writing new documents, but reading, which is followed closely by annotating, then collaborating, and finally authoring.

Marshall (1997) asserts that the act of annotating may implicitly reveals the reader's engagement with the material because annotating discloses how the reader comprehends the text. In addition, annotations also help readers to remember and to locate information visually. According to Adler et al. (1998), annotation takes up 48% of a reader's writing during a reading session, while Glover, Xu and Hardaker (2007) assert that note taking can benefit learning because further context is integrated within the original context. Desmontils (2004) argue that annotations help develop a reader into a writer. Ovsiannikov, Arbib and McNeill (1999) contend that annotation can increase learning efficiency because it promotes memorization, thinking and clarification process. Bringay et al. (2004, cited in Hwang, Wang & Sharples 2005) state that the reader uses annotation to appropriate the document, and to rewrite it accordingly while reading the text.

Many annotation systems and software have been proposed during the last decade. The Annotea project has been developed for the purpose of enhancing collaboration by sharing annotations, bookmarks, and a combination of annotation and bookmarks. The project is supported by the Worldwide Web Consortium as part of its Semantic Web development (Hwang, Wang & Sharples 2005). A system called CoNote that enables a group of people to communicate via shared annotations on a set of electronic documents was proposed by Davis and Huttenlocher (1995, cited in Hwang, Wang & Sharples 2005). Davis and Huttenlocher assert that shared annotations of documents provide a richer communications forum than electronic media such as newsgroups, bulletin boards and email distribution lists. In addition, two types of annotation tools were proposed in the new millennium. Lee, Tiernan and Grudin's (2001) prototype allows viewers of audio and video

to create and share text annotations that are synchronized with the multimedia. They found that the use of group exercises can promote engagement and system use. Nokelainen, Kurhila, Miettinen, Floreen and Tirri (2003) did a study on a shared document-based annotation tool called EDUCOSM. This system was used in a real-life collaborative learning, in which the results indicate that those learners who are willing to do real work with the tools provided by the system are able to elaborate on what they are doing, produce both highest quality annotations and learning outcomes. A review of projects on annotation systems and software have clearly established evidence that annotation systems have the potential to facilitate understanding of the reading texts, helps develop a reader into a writer and promote collaborative learning.

ANNOTATION TOOLS IN TEACHING AND LEARNING

Studies on digital annotations reveal that digital annotations offer higher potential than paper annotations to support accessing, indexing, distributing, linking, and sharing (Agosti et al. 2004, Arko et al. 2006). Web annotation tools allow users to annotate on hypertexts, to organize and present annotations, to build up knowledge structures, to browse annotations previously made by others, to share annotations with other users and to interact with other users (Wolfe 2002, Rau, Chen & Chin 2004). Furthermore, readers who share their annotation with others are also more careful in their annotation because they are aware that their annotations can be seen by others. Chan and Yap's study (2010) on how online writing in ESL context can encourage public discourse indicate that despite students' fear and lack of confidence in sharing their writing online, the students are confident to write their discussions in a public forum and they also appreciate the value of such participation in an online forum. This implies that there is value in sharing information, such as online annotation.

Johnson, Archibald and Tenenbaum (2010) employed the Social Annotation Learning Model system (SAM-LS) in order to find out how social annotation systems help facilitate learning and improve the quality of instruction. This software enables multiple learners to share their thoughts and respond to each other, which promotes critical thinking. The researchers set up two different settings in their study: (1) different instructional methods based on highlighting, annotating and reviewing of peers and instructors' highlighting and annotations and (2) evaluate the effect of the five different instructional methods on individual and group work outcome. The findings showed that annotation, highlighting and reflection process have a stronger effect when students team up with another student compared to students who work with the SAM-LS tool alone. The results support the notion that having text annotation as well as some form of verbal interactions with peers has significant effect on student learning, specifically in reading comprehension and meta-cognition.

Kawase, Herder and Nedjl's (2009) comparative study between online annotations and paper based annotations revealed that participants gave positive remarks about the electronic annotation tools. 18 people participated in the experiment using the annotation tool, while 22 Doctorate students and post-doctorate students participated in the paper based annotation study. Despite the differences in the total number of annotation made by the participants in the online annotation and paper based annotation, the researchers conclude that the act of annotating supports the learning process, both in online based annotations and paper based annotations. Some of the remarks made for the electronic annotations are that they are easy to use, useful, collaborative, helpful, convenient, friendly and innovative. Lu

and Deng (2013) investigated how active reading can be facilitated among students with the use of an online annotation tool; Diigo. The participants were divided into two classes; with 42 students in class A and 27 students in class B. The students were required to use Diigo to accomplish the annotation task. The findings showed that students performed similar behavior with paper based annotation, which is highlighting. Different colours were used to highlight important ideas and to compare ideas. Sticky notes were also used to integrate notes, such as to define terms, analyze different positions, record thoughts, and make claims and draw conclusions. The researchers claim that the combination of highlighting and sticky notes was significant as highlighting served to contextualize the sticky notes.

Hwang, Wang, and Sharples's experimental study (2007, cited in Lu & Deng, 2013) found that the use of an online annotation tool enhance students' learning achievement and motivation. Results from Nokelainen et al.'s (2005) study show that university students in web-based courses thought that a digital annotation system added value to the learning process and changed their study habits favorably. The students also reported that the digital annotation system would be useful in other courses. Hasan et al. (2007) did a study based on the development of a Collaborative Annotation System in a foreign language learning environment and found that the system can facilitate collaborative learning. They argue that the system assists collaborative learning because it enables the students to upload, annotate and share their personal multimedia collections. Results based on the employment of various forms of digital annotation such as web annotation, social annotation software and annotation tool, such as Diigo, in the reviewed studies have established that digital annotation tools have potential to facilitate reading comprehension and learning process; both individually and collaboratively.

The design of the online annotation tool in the present study was based on prior findings on what ESL students at tertiary level do when they read and how they comprehend reading texts when they read printed and online texts (Afendi Hamat et al. 2010). In addition, the design incorporates findings from previous studies on annotation tools that allow users to annotate on the online texts, insert prompts and questions within the text itself, insert hyperlinks, browse annotations previously made by others, and share annotations with other users. Despite the increasing number of studies on the employment of online annotation tools and their potential to increase and improve reading comprehension and learning process, the literature has not reported any studies on the use of online annotation tool in the Malaysian context. Therefore, it is timely to conduct the present study.

THE STUDY

The online reading system in the present study takes cognizance of the use of reading strategies by ESL readers when engaging in the academic reading process. This allows the designer to design an online reading system that provides compatible technological tools to enhance and facilitate the reading process and content uptake. An investigation concerning the reading strategies of ESL learners at tertiary level was conducted prior to the design process to determine how these strategies can be mapped onto appropriate e-literacy tools for an online reading system suited to ESL tertiary learners' academic reading needs (Nor Fariza et al., 2009; Afendi Hamat et al. 2010; Nor Fariza et al., 2011). To reiterate, the focus of this study is to investigate students' use of the Annotation tool, in comprehending online reading texts. Information about the design and function of the tool has been presented in the earlier sections (see Introduction and Annotation tools in teaching and learning sections)

METHODOLOGY

PARTICIPANTS

Participants in this study involved 81 respondents (65 female, 16 male). The participants were first-year students from three bachelor's programs: English Language Studies, Teaching English as a Second Language, and Literature. They were in the first semester of year one when this study was conducted and were enrolled for a Language and Linguistic course at the School of Language Studies and Linguistics, Faculty of Social Sciences and Humanities, UKM. The course is a compulsory course for year one students. The participants had completed their Matriculation or Foundation level course, which was conducted for a year at various institutions in Malaysia, prior to enrolling for a degree course. They had some basic knowledge of linguistics such as phonetics, phonology and syntax, which they learned during their Matriculation or Foundation level course.

INSTRUMENT AND DATA COLLECTION PROCESS

A questionnaire which comprises statements to determine the suitability and usefulness of the system for the targeted audience was developed and distributed to the participants. There are four sections in the questionnaire: section A – to gather general information about the participants' use of computers and exposure to online reading materials, section B – their usage of the system (time spent on the system, the usefulness of each technological tool in the system and frequency of use), section C – the suitability and usefulness of each technological tool in the system in comprehending the online reading materials and section D – the participants' overall perception of the system. The questionnaires were distributed to the participants at the end of the semester (each semester runs for 14 weeks). The researcher explained each item to the participants to ensure that they understood the questions. The questionnaires were returned two days later to the researchers. Out of 81 questionnaires distributed, 53 questionnaires (65.43%) were returned, which is a return rate of more than half. 42 questionnaires (79.24%) were from female respondents and 11 (20.75%) were from male respondents.

Focus group interviews were conducted to gain more in depth information from the participants regarding their perception and evaluation of the system. 14 participants were interviewed, consisting of five male and nine female students. The participants were divided into three groups, consisting of five participants (in two groups) and four participants in the third group. The interview was voluntary as it was felt that students who volunteered would provide reliable information because they were not forced to participate in the interview. Three interview sessions were conducted and each interview session lasted between 25 and 30 minutes. General questions were developed to guide the interview. Interview questions were posed to all students. However, there were moments when some of the students were asked to elaborate or clarify certain points. This happened when the students' responses were unclear. For instance, if the student only said that the tool is good, the student was asked to explain or elaborate on what he meant by "the tool is good".

PROCEDURE

The online reading system was introduced to supplement the teaching and learning for the course. The students were introduced to the system in the second week of the semester. The

designer of the system briefed the students about the online reading system during the lecture, which was further taken up in tutorials by the respective lecturers of the course. To help students become familiar with the system, the students were asked to respond to a short text on language acquisition in week 3. The text was two paragraphs long. Questions were inserted at the top of the text to guide students in the process of making annotations in the text (refer figure 3). In addition, students were given questions in the forum to further prompt them to discuss the text with their friends. The lecturers also responded to the annotations done by the students, in addition to feedback which students received from their friends. Some of these annotations were then discussed in class in order to ascertain if the notes made have helped increase students' understanding of the topic taught.

The course coordinator also uploaded three more texts; in week five, seven and ten. Each text was accompanied by questions to guide the students to read the texts in a more structured manner. The researchers felt that since these students are in year one and that the subject was new to them, any form of assistance that could help in the reading process should be provided. In fact, the students acknowledged that the guiding questions helped them to find the main idea, summarize the text and make annotations.

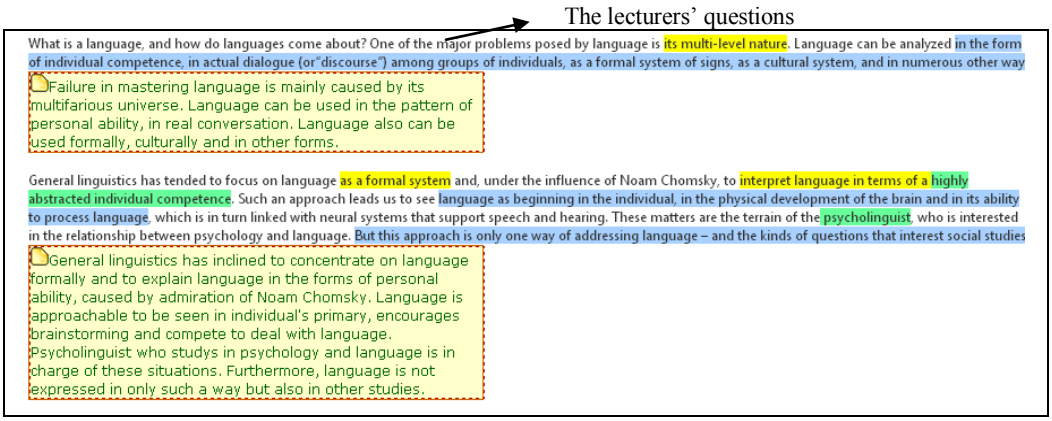

FIGURE 3

RESULTS FROM QUESTIONNAIRE

Results obtained from the questionnaires are shown in Table 1. The findings answered research question 1, which is "What do the students used the annotation tool for?" Findings from the questionnaire revealed that the majority of the students gave positive feedback pertaining to their usage of the Annotation tool. The highest percentage was for highlighting important parts of the text they do not understand (98.11%), followed by highlighting important points (94.34%). This clearly indicates that highlighting plays a major role in making annotation. Three colours were available for students to indicate different purposes of highlighting; yellow to indicate main ideas or main points and own understanding, blue for questions and green to express agreement, write similar meanings of the highlighted word and others. The use of the different colours also helped the lecturer to determine the types of annotation made by the students. The students were also found to employ the Annotation tool to write comments directly into the text and to share understanding of the text with their friends. Similar percentage was scored for these two purposes of annotation, which was at 90.57%. The students also suggested websites that they feel were relevant to the texts, in order to help their friends get more information about the text or read materials related to the

texts. 82.66 % of students reported doing this. When the students were asked if it is necessary to highlight the text to help them understand it, majority of them (77.32%) agreed to this. However, 22.64% stated that they do not need to highlight the text. As for writing in the text, 81.13% agreed that writing helped them to improve and increase their understanding of the texts, while 18.87 disagreed. Finally, a majority of students (84.91%) agreed that it is essential to share information to help them understand the texts. Only 15.09% expressed disagreement.

Analysis of the type of annotations made by the students showed that the annotations range from forming questions, inserting similar words, expressing agreement or disagreement, making references or links to something which the students have read, expressing ideas and opinions, writing summary, explaining, defining and inferring. The types of annotation also demonstrate that the students were making notes for personal use as well as for sharing with others. They are also aware that the act of sharing notes helped them learn about the discussed topics from their friends.

TABLE 1. Usage of the Annotation tool

The Annotation tool helps me to comprehend the text because I:	Strongly agree		Agree		Disagree		Strongly disagree	
	n	%	n	%	N	%	n	%
a. Highlight parts of the text that I do not understand.	22	*41.51*	30	56.60	-	-	1	*1.89*
b. Highlight important points in the text.	18	*33.96*	32	*60.38*	-	-	3	*5.66*
c. Remember the points by highlighting.	28	52.83	23	*43.40*	2	*3.77*	-	-
d. Write comments directly into the text.	12	*22.64*	36	67.93	-	-	5	*9.43*
e. Suggest websites relevant to the text.	21	*39.26*	23	*43.40*	3	*5.66*	6	*11.32*
f. Share my understanding of the text with my friends.	19	*35.85*	29	54.72	-	-	5	*9.43*
g. I don't need to highlight the text to understand it.	7	*13.21*	5	*9.43*	20	*37.74*	21	*39.62*
h. I don't need to write notes to help me understand the text.	6	*11.32*	4	*7.55*	19	*35.85*	24	*45.28*
i. I don't need to share information to help me understand the text.	8	*15.09*	-	-	25	*47.17*	20	*37.74*

RESULTS FROM INTERVIEW DATA

Results from the interview data showed that the Annotation tool helped students to organize their own notes and to share the notes with their friends, hence, students' responses can be divided into two types; personal learning and collaborative learning. The interview data in Table 2 represents students' use of the Annotation tool for personal learning.

S1 and S14 reported that the tool help them to organize their thinking and write notes about the texts. They can also check their notes at anytime. S2 related that making comments immediately in the text helped her to remember what she had read. This sense of immediacy and convenience is also commented upon by the other students. S2's comment is similar to S3 and S5's comments. S3 and S5 like the idea of writing notes immediately, online. The students made annotation (short notes) next to the word or phrases. All students reported that they used the highlighting tool to indentify main ideas or points, and to indicate words and

parts of texts that they did not understand. They like the idea of having different colours for highlighting because it helped them to remember what their notes are about. S6, S11, S12 and S14 said that the notes assisted them in writing summaries of the text. S8 who is more adept at technology liked the multimedia function. It is, therefore, evident that all students have affirmative perceptions about the tool.

TABLE 2. Personal learning

Student	Excerpt from interview
S1	It help me *organize my thinking* because I can write notes.
S2	I like because *I can comment immediately in the text* so I don't forget what I think and understand.
S3	*I can write notes online* and I can insert multimedia too. I like that.
S4	It makes things more easy because I don't have to do writing on paper. *I can just type online and I can use different colour to make notes. The colour tells me what my notes about.*
S5	The system is like electronic paper, *we can read and jot notes immediately*. No need to carry paper…
S6	I think *the tool help me to understand the texts, discuss main ideas and help me do writing on the topic*. If I do myself, I don't think I can do many.
S7	It *give me more understanding about the reading text because I can make notes online.*
S8	I like the tool because *I can use different colour for my notes* and use multimedia. I think it is fun learning.
S9	*What I like is the annotation tools and the highlight tools where you can highlight those supporting ideas and main points also those words that you don't understand*.
S10	The system is really convenient because *the annotation helps us to highlight the main idea also includes the supporting details and words we doesn't understand.*
S11	*It helps to do the summary and identify main ideas.* I like because *I can write immediately online.*
S12	First I found it very difficult then *I try to adapt to it by doing annotate first, spot idea then started doing my summary. I found the system is very helpful.*
S13	It's a good thing. *We can write our notes that help us to understand the te*xt.
S14	*I can organize my notes better* and *I can check what I write anytime* I want. This will not make me forget.

The interview data in Table 3 showed students' use of the Annotation tool for collaborative learning purpose. Majority of the students agree that comparing notes online with their friends allows them to ascertain whether their ideas and understanding of the texts are similar to their friends. This resulted in increase confidence about their ability to understand the topics taught in the course. S6 and S7 found that the opportunity to look at their friends' notes guided them in their thoughts about the texts, hence, writing notes about the text became much easier. S8 said sharing made learning more fun. S14 and S8 like the tool because they can discuss the texts online and this help solved the problem of having group discussion, especially when everyone in the group is busy. The positive comments given by the students illustrates that the tool provided virtual space for interaction and engagement in the reading process.

TABLE 3. Collaborative learning

Student	Excerpt from interview
S1	*My friends also can see my notes and we can discuss.*
S2	If *my friends want to compare notes, they also can see my notes.*
S3	I also like the tool because *if I cannot understand I can look at my friend's notes*.
S4	*I can see what my friends write. So I know if my ideas are correct or not.*
S5	No need to carry paper and *I can get ideas from my friends also.*
S6	*…The tool help me to see my friends' notes and make me think.*
S7	It give me more understanding about the reading text because *I can make notes online and share with my friends.*
S8	I think it is fun learning. *If we busy, we can discuss about the text online when we see our friend's notes.*
S9	*Maybe if anyone sees my notes they might help to explain to you*.
S10	Besides that sometimes *if we don't have main idea we can refer to some of our friends notes after that we can have confident can if we have doubt we can discuss.*
S11	*We can see others opinion on it and maybe we have others opinion maybe we try to compare it with yours.*
S12	I found the tool very helpful because *it helps us to interact.*
S13	The text given is not that long and *we can discuss among our friends*.

S14	This system is suitable for me because *I don't have to see my friends to discuss especially when we busy. We share what we write online.*

DISCUSSION

Results from the questionnaires and interviews confirm that the Annotation tool assisted the students in comprehending the online reading texts for they used the tool to indicate main points or ideas (highlighting function), write notes based on their comprehension of the texts, write summaries of the texts, compare notes with their friends and discuss the texts in the online discussion forum. The types of annotation made corresponds to Marshall's (1997) category of annotation, which include highlighting and marking words or phrases, and within text-markings, and making notations within the text. The act of highlighting and the types of annotation made by the students in the present study also demonstrated that the students are actively processing information; a finding supported by Adler and Doren (1972, cited in Chiang, 2011), who claim that an important characteristic of processing information actively is making annotations while reading. This facilitates recall of information about the reading texts because the participants in this study could discuss the texts and made reflective comments about it during tutorials and in the online discussion forum. Findings in the present study also demonstrate that the Annotation tool helps the students navigate the reading texts because they do not just annotate, but they could also refer to earlier sections of the texts immediately, and refer to their friends' annotation. This process helps develop students' awareness that reading is not a linear process.

In addition, the types of annotation made by the students such as forming questions, linking the information to something which the students have come across or read, expressing agreement and disagreement, writing summary, explaining and other types of annotations are evidence that the students are involved in active reading, which provides support to them in understanding the texts and the topics taught in the course. This finding is similar to Lu and Heng's study (2013), which reported that their participants used sticky notes to define, show understanding, make links, make comparison, explain and make inferences in the process of reading. The annotation made benefitted the participants in the present study's reading process, as emphasised by Glover, Xu and Hardaker (2007). They assert that note taking can benefit learning because additional information is integrated within the original context.

CONCLUSION

The present study was designed to investigate how a group of ESL students' used the Annotation tool, which is integrated in an online reading system. The findings from the questionnaire showed that the students used the Annotation tool in various ways, which facilitate their reading comprehension process. The act of highlighting has been shown to be the most popular and recognized as the most useful annotating feature. The three different colours for highlighting further assisted the students in making more structured annotations. This finding is significant, for the students in the interviews reported that the different colours aided them in distinguishing the types of annotation made about the reading texts. The results from the types of annotation made by the students, which served a range of purposes, in combination with the highlighting features, prove that the students were involved in active reading. The process of active reading is essential as it entails higher order thinking skills such as comparing, analyzing, explaining and others. It is thus, evident, that the act of

annotating supports the learning and reading process (Wolfe 2002, Desmontils 2004, Agosti et al. 2004, Rau, Chen & Chin 2004, Arko et al. 2006, Kawase, Herder & Nedjl 2009).

A significant insight from the present study demonstrates that the immediacy of making annotations online is beneficial for it allows the students to encode their ideas immediately, thereby facilitating recall of the reading texts. Another pertinent finding is that access given to view personalized notes increased the level of reading comprehension. The lecturers' observations of the students' online forum discussion about the text and discussion of the texts in the tutorials revealed that there were reflective questions about the texts, such as "We can also relate this to Krashen's hypothesis", "Does this mean that children should learn as many languages as they can?", "I don't agree with you. The phrase means we must pay attention to nonverbal communication". The act of sharing information help users to reflect not only on the text, but also on new ways to respond to materials, respond to reading, and respond to have their readings shaped by the thoughts of others (Johnson, Archibald & Tenenbaum 2010, Chiang 2011). This study has also shed some light on how an online annotation tool can be used for pedagogical purposes for it assists teachers in monitoring and understanding their students' reading process. Teachers can use information obtained from their students' annotation to provide scaffolding measures to help students' reading comprehension process. The results illustrate that the Annotation tool does facilitate comprehension and memory. There is also potential for the online annotation tool to be used as a platform for transfer of information as students learn from and with each other and their lecturers.

This study, nevertheless, has its limitations. The online annotation tool in the present study is still at its prototype stage, hence, further improvement can be made. The next phase would be to incorporate a function which allows editing or comments on other individual's annotations. In addition, since there are several new annotation software in the market, these software need to be studied and perhaps incorporated based on the needs of the course and the students. Furthermore, this online reading system is only used with students from one program and one faculty. The next step in the research would be to conduct studies with students from various faculties because the types of reading materials for students from the engineering and mathematics faculties, for instance, differ from students from the social sciences faculties.

Although future studies are suggested to improve and enhance our understanding of online annotation tool, the current results suggest that there are positive benefits in using the tool to facilitate reading comprehension and develop reflective thinking.

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